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General and complete disarmament

Effects of the use of armaments and ammunitions containing depleted uranium

Report of the Secretary-General

Summary

The present report contains views of Member States and relevant international organizations on the effects of the use of armaments and ammunitions containing depleted uranium. The Secretary-General has, to date, received 13 reports from Governments, in addition to responses from IAEA and WHO.

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I. Introduction

1. The General Assembly, by paragraph 2 of its resolution 63/54, invited Member States and relevant international organizations, particularly those that have not yet done so, to communicate to the Secretary-General their views on the effects of the use of armaments and ammunitions containing depleted uranium, and requested the Secretary-General to submit a report on this subject to the General Assembly at its sixty-fifth session.

2. On 9 February 2010, a note verbale was sent to Member States requesting them to submit their reports by 1 June 2010. The Office for Disarmament Affairs also submitted a similar request to the International Atomic Energy Agency (IAEA), the United Nations Environment Programme (UNEP) and the World Health Organization (WHO).

3. To date, the Secretary-General has received 13 replies from Governments, in addition to responses from IAEA and WHO. The replies received are reproduced in section II below. Additional replies received from Member States will be issued as addenda to the present report.

II. Replies received from Governments

Belgium

[Original: French]
[12 April 2010]

1. The Act of 11 May 2007 (published in the *Moniteur belge* of 20 June 2007), supplementing the Weapons Act of 8 June 2006, entered into force on 20 June 2009. This General Act states that no one shall "manufacture, repair, offer for sale, sell, transfer or transport these types of proscribed weapons, nor shall they keep such weapons in storage, in their possession or on their person", and inert munitions and armour plating containing depleted uranium or any other type of industrial uranium are now classified as proscribed weapons.

2. The prohibitions established by the Act are applicable not only to the State and the public authorities, but also to private actors. The Act also stipulates that existing stockpiles of depleted uranium in Belgium must be destroyed within three years from the publication of the Act in the *Moniteur belge*. It should be recalled that this Act, passed in 2007, was originally a parliamentary initiative. The Act entered into force two years after the day of its publication in the *Moniteur belge*, i.e. on 20 June 2009.

3. Parliamentary hearings with contributions by scientific experts were held before the Act was adopted. Various points of view were expressed regarding assessment of the risks to health and to the environment posed by the use of cluster munitions. Belgium is closely following all developments in the scientific analysis of the risks associated with the use of depleted uranium weapons systems, including studies conducted at the international level.

4. Belgium is thus the first country in the world to have implemented such a ban, which was imposed on the basis of the principles of caution and prudence.

5. Furthermore, a new Act prohibiting investment in the depleted uranium sector was enacted on 16 July 2009 (published in the *Moniteur belge* of 29 July 2009). This Act now prohibits banks and collective investments schemes holding financial instruments from granting loans to manufacturers of inert munitions and armour plating containing depleted uranium or any other type of industrial uranium.

6. In view of the ban on investment in the aforementioned proscribed weapons, the Belgian Parliament considered it logical to expand the specific ban on direct or indirect investment in companies that manufacture weapons containing depleted uranium, something which had not yet been done.

7. The relevant legislative text was adopted unanimously by the Belgian Chamber of Representatives and its Senate. Belgium stands ready to provide the United Nations with any necessary clarification of the definitions, aims and modalities of the Belgian Act of 11 May 2007.

8. Belgium also expresses its readiness and, where appropriate, offers its expertise, to provide information requested by any interested State, particularly States in the process of establishing relevant legislation, on the basis of Belgian legislative experience.

9. Lastly, Belgium is open to any consultations deemed useful by other States that may have adopted comparable legislative bans, in order to explore opportunities to promote such a legislative approach at the international level.

Burundi

[Original: French]
[18 May 2010]

The use of depleted uranium in the manufacture of armaments and ammunitions

1. Depleted uranium is the waste or residue obtained from using enriched uranium in civil and military nuclear reactors. While depleted uranium is regarded as a waste product, it nevertheless maintains its radioactive properties.

2. It is also called "depleted" because it is 40 per cent less radioactive than natural uranium.

3. During the 1990s, researchers in the weapons industry discovered many advantages to using depleted uranium in the manufacture of armaments and ammunitions. First of all, as a waste, it is more cost-effective than other metals. Technically, depleted uranium is valuable because it can burn quickly at temperatures between 300 to 600 degrees Celsius and also because it is nearly twice as dense as lead. All of these properties of depleted uranium led to the manufacture of depleted uranium projectiles or penetrators whose main feature was the ability to pierce the armour plating of tanks and to destroy underground bunkers.

The use of armaments and ammunitions containing depleted uranium

4. The first use of depleted uranium armaments and ammunitions occurred in the Gulf War of 1991.* Each subsequent war, particularly in Bosnia, Kosovo,

* Translator's note: an entire line is missing from the French original.

Afghanistan and Iraq, was an opportunity for the major military Powers to test their new depleted uranium weapons.

Consequences of the use of depleted uranium ammunitions

5. Several international humanitarian organizations have conducted studies on the use of depleted uranium armaments, whether in combat zones or on soldiers involved in combat operations. These studies have concluded that depleted uranium contamination poisons the environment for several thousands of years and causes many cancers and other serious diseases among the affected population. It also causes terrible birth defects. It has been noted that the toxicity of depleted uranium becomes more dangerous when it takes the form of dust, which can be ingested or inhaled. In this form it can be easily carried by the wind and rain, and vast areas become contaminated.

6. This situation led to the emergence of the "International Coalition to Ban Uranium Weapons", which has even gone as far as proposing a resolution against the use of these armaments and ammunitions. All members of the Movement of Non-Aligned Countries and all developing countries voted in favour of the resolution; however, the major nuclear Powers (including the United States of America, France, the United Kingdom, Israel and others) voted against it, arguing that the negative effects ascribed to depleted uranium had not been scientifically proven. The United Nations General Assembly therefore decided to defer the matter to its sixty-fifth session in order to give Member States and relevant organizations the time to express their supporting or opposing views on the use of depleted uranium armaments and ammunitions. This presupposes that the World Health Organization (WHO), the International Atomic Energy Agency (IAEA) and other sufficiently competent bodies should be able to provide pertinent arguments on this matter. Similarly, the States that voted against the resolution should also submit evidence about the non-toxicity of depleted uranium.

7. It should be noted that while some military Powers do not wish to recognize the effects of depleted uranium officially at the international level, they recognize them socially at the national level by agreeing to compensate affected soldiers and their families. The decision not to recognize these effects may have been taken in order to avoid convictions, which even extends to compensating those directly or indirectly affected in their own countries.

8. Burundi wishes to incorporate the following observations in its views:

- Burundi has already voted against the use of armaments and ammunitions containing depleted uranium, and its position should remain unchanged at the forthcoming session of the General Assembly;
- Burundi does not have arms industries whose interests could be threatened by the prohibition of depleted uranium armaments and ammunitions;
- Burundi may not have the capacities to contribute to scientific research on this issue;
- The results of the studies already carried out remain relevant, despite being contested by the nuclear Powers.

9. In conclusion, Burundi would like to support the idea of prohibiting the manufacture and use of depleted uranium armaments and ammunitions.

Cuba

[Original: Spanish]
[9 July 2010]

1. The wide margin of votes cast in favour of General Assembly resolution 63/54 clearly reaffirmed the broad and growing concern of the international community over the danger to human health and the environment from the use of armaments and ammunitions containing depleted uranium.

2. The international campaign against the use of these types of arms has continued to gain momentum and parliaments around the world are approving measures every day to move towards a moratorium on their use.

3. The submissions transmitted to the United Nations Secretary-General from countries directly affected by such radioactive waste during armed conflict demonstrate that the use of depleted uranium can severely damage humanity. Independent studies and investigations conducted among affected populations, and the troops involved in military action in those areas, show an exponential increase in cases of cancer and other associated diseases, as well as in birth defects and other health conditions.

4. The information provided to the Secretary-General from the International Atomic Energy Agency (IAEA), the United Nations Environment Programme (UNEP) and the World Health Organization (WHO) confirms that the use of these arms has long-term detrimental effects. Furthermore, these organizations have recommended that monitoring systems should be established in the areas where these types of arms have been used in order to study their future effects; that monitoring and decontamination systems should be established in those areas; and that levels of public information should be increased. These appeals for caution confirm the validity of existing concerns.

5. It should be recalled that depleted uranium is included in the list of regulated nuclear material, including for its peaceful uses (article XX of the IAEA Statute). When this substance is used in armaments and ammunitions involved in armed conflict, it is "transferred" in violation of the requirements established by IAEA concerning its export and transfer and, additionally, without the consent of the recipient States.

6. In practice, depleted uranium is being used by some arms-manufacturing countries to circumvent international regulations and thereby to reduce their physical inventories of unwanted nuclear material.

7. It is contradictory that, while there are legally binding standards which regulate the use of nuclear material for peaceful purposes, including depleted uranium, there is no limit on the use of depleted uranium in the military sector, especially in cases when this material is used for offensive purposes as part of the strengthening of projectiles, bombs and missiles.

8. According to the Army Environmental Policy Institute of the United States of America, United States aircraft fired 940,000 depleted uranium projectiles over Iraq in Operation Desert Storm in 2003 alone, while 14,000 depleted uranium rounds were also used during the ground offensive. It is conservatively estimated that

between 300 and 800 tonnes of radioactive dust and particles were spread over land and water in the Middle East region alone.

9. Cuba reiterates the arguments previously transmitted to the Secretary-General, which were published in document A/63/170. Armaments and ammunitions containing depleted uranium constitute a threat to life and to the environment.

10. Until further research yields results, Cuba considers that the United Nations General Assembly should take the following steps:

- Request Member States that have used armaments and ammunitions containing depleted uranium in armed conflict to provide to the competent authorities of the countries affected, as a matter of urgency, comprehensive information about the location of the areas where they were used, and the quantities used, to facilitate the assessment, administration and clearance of the contaminated areas; and,
- Request Member States that have used armaments and ammunitions containing depleted uranium in armed conflict to provide the necessary financial and technical assistance to the States and persons affected, including with a view to cleaning up the contaminated areas and promoting education in order to minimize risks.

Czech Republic

[Original: English]
[24 March 2010]

The Czech Republic does not possess any weapons, armaments or ammunition that contains depleted uranium and does not envisage acquiring any in the future. The Czech Republic closely follows studies concerning the use of depleted uranium and its effects, especially those undertaken within the United Nations system, e.g., by the World Health Organization, and it monitors conditions of the Czech Army personnel that may be deployed in international missions in areas where the use of depleted uranium could be suspected. Pending the existence of a clear and authoritative opinion on this matter, the Czech Republic reserves the right to form a definitive position on the issue of depleted uranium.

Ireland

[Original: English]
[26 August 2009]

1. In accordance with paragraph 2 of resolution 63/54, Ireland submits its views to the Secretary-General on the effects of the use of armaments and ammunition containing depleted uranium. Ireland does not possess (and has never possessed) any weapons, armaments and ammunitions containing depleted uranium.

2. Ireland shares the concerns raised in the General Assembly about the potential risk related to the use of depleted uranium in armaments and ammunition. Ireland voted in favour of resolutions 62/30 and 63/54.

3. While there is no practical method of testing the people that may have been exposed to depleted uranium, thorough medical examinations are carried out on all Defence Forces personnel returning from deployment overseas. These include tests intended to detect signs of those diseases processes most likely to arise in case of contamination with depleted uranium. To date no evidence of an unusual incidence of disease has been found.

4. Ireland notes that, while a number of studies have been conducted by the relevant international organizational organizations, no definitive conclusion has been drawn on the potential adverse effects of the use of armaments and ammunition containing depleted uranium on human health and the environment. Ireland will continue to closely monitor developments in the analysis of the risks associated with the use of armaments and ammunition containing depleted uranium and welcome the engagement of civil society, non-governmental organizations and the scientific community on this issue.

Japan

[Original: English]
[17 June 2010]

1. In accordance with paragraphs 2 and 5 of resolution 63/54, entitled "Effects of the use of armaments and ammunitions containing depleted uranium", adopted by the General Assembly on 2 December 2008, Japan submits its views to the Secretary-General on the effects of the use of armaments and ammunitions containing depleted uranium.

2. Japan has neither owned nor used armaments and ammunitions containing depleted uranium. Japan recognizes that, despite the studies conducted by relevant international organizations on the effects of use of armaments and ammunitions containing depleted uranium on human health and the environment, at present no internationally definitive conclusion has been drawn. Japan will continue to follow carefully the developments of the studies conducted by the relevant international organizations.

3. Japan would like to call upon all relevant international organizations to conduct successive onsite studies and further information-gathering, including the latest scientific findings, with due attention to the opinions and activities of the interested NGOs in this field, and to provide their views on the effects that the use of depleted uranium munitions may/can cause on the human body and the environment. In this connection, Japan intends to continue to engage in dialogue, where appropriate, with civil society on this matter.

Jordan

[Original: Arabic]
[30 April 2010]

Depleted uranium

1. Introduction:

(a) Raw uranium contains about 0.71 per cent U-235, 99.28 per cent U-238, and some 0.0058 per cent U-234;

(b) The term "depleted uranium" is applied to uranium of which, during the enrichment process, the U-234 and U-235 content has been considerably reduced. U-235 is used to produce nuclear bombs and in nuclear reactors;

(c) After the enrichment process, depleted uranium contains 99.8 per cent U-238 and 0.2 per cent U-235. That material is readily useable for a variety of purposes.

2. Characteristics of depleted uranium:

(a) Its particles combust easily during friction or collision with a given body;

(b) Its density is 1.6 times higher than that of lead;

(c) Most of the energy emitted by uranium is in the form of alpha particles, albeit beta particles and gamma rays are by-products of the disintegration of atomic nuclei;

(d) Depleted uranium is silver in colour, but turns black, yellow or dark gold when exposed to air.

3. Health risks of depleted uranium:

(a) The principal health risk posed by depleted uranium is that, as a heavy metal, it is toxic. As happens with lead, another toxic heavy metal, when fragments of depleted uranium remain in the body, the kidneys are damaged, and all vital body functions are affected;

(b) Another hazard is that of ionization, particularly by alpha particles;

(c) The impact of depleted uranium depends on the way in which it enters the body;

(d) Particles of depleted uranium produced by the detonation of missiles armed with that material can dissolve in the blood. The kidneys are most susceptible to damage, but other parts of the body, including the bones, may also be affected. Depleted uranium can remain in the bones for a period of between 1,500 and 5,000 days;

(e) Some 60 per cent of uranium which does not dissolve in the blood and reaches the lungs is eliminated within 500 days;

(f) Current medical remedies are capable of alleviating the physiological impact of contamination with depleted uranium.

4. Indicators of the use of depleted uranium ammunition:

(a) It is easy to tell when an armoured vehicle has been hit by depleted uranium ammunition: the entry hole is small and the exit hole only slightly larger, whereas when conventional ammunition is used, both entry and exit holes are large. The most significant difference is that depleted uranium ammunition leaves nuclear residue which can be detected by using AN/VDR2, AN/PDR27 and AN/PDR77 radiac instruments. Conventional ammunition leaves no nuclear or radioactive residue;

(b) When depleted uranium combusts, particles of uranium oxide in the form of a heavy black dust arise within and around the vehicle and usually travel, with steady winds, to a distance of some 50 metres from the point of ignition.

5. Action to be taken in case of contamination by depleted uranium:

(a) In case of contamination by depleted uranium, the following measures should be taken:

(i) Removal to an area that is well away from any water source or place where food is stored;

(ii) Irradiated material on the person or on equipment should be brushed, wiped or washed;

(iii) Further contamination should be limited by dealing properly with the water used in the washing process;

(iv) Residue should be placed in a marked area or disposed of;

(v) A report in which the extent, type and level of nuclear contamination in the area is identified should be submitted to the supreme command;

(b) Should any depleted uranium be discovered on the ground, it should be covered, because it will emit alpha particles. Consequently, any barrier placed over the source will reduce risk.

6. Emergency first aid:

(a) When a victim is removed from a damaged or burned vehicle that is contaminated by depleted uranium, protective clothing and gloves should be worn and it should be established that there are no hazards, the most dangerous of which would be fire. Evacuation of victims, first aid and the necessary medical procedures should have priority over decontamination;

(b) Detection devices should be used in order to ascertain whether injuries are contaminated with depleted uranium or any other radioactive material;

(c) All wounds in the hands, arms, feet and legs that are suspected of being contaminated should be washed as soon as possible in order to remove any possible radioactive material;

(d) When there are multiple injuries, the emergency services should be contacted immediately and it should be indicated on the medical notes that the victim is contaminated by nuclear radiation. If possible, the decontamination process should be carried out without any negative impact on the victim.

7. The effect of radiation on the blood:

Red corpuscles are less affected because they contain a nucleus that can withstand up to 1,000 rem before their numbers are perceptibly reduced.

B and T white corpuscles are considered vulnerable to radiation because their numbers are considerably depleted when exposed to only a few hundred rem. It takes the body several weeks to restore levels to what they were before the radiation incident. Blood platelets are similar to white corpuscles in the way they are affected.

8. The effect of radiation on the digestive system:

(a) The mouth and pharynx are less sensitive to radiation, while the stomach is more sensitive, because the cells that excrete hydrochloric acid and pepsin stop doing so when exposed to a few hundred rem;

(b) The small intestine is the part of the digestive system that is most vulnerable to radiation: exposure to a few hundred rem halts the production of the cells that line the small intestine and thus destroy it from within. Blood and plasma pour into the digestive tract, the microbes that are in that tract are transferred to the blood and spread to all parts of the body, leading to death.

9. The effect of radiation on chromosomes:

Each cell of a human body contains 46 chromosomes that carry all a person's genetic information. One hundred rad is sufficient to mutate chromosomes in a way that differs from the mutation caused by burns or chemical materials. A chromosome is capable of rectifying a mutation caused by up to 1,000 rad before it is completely destroyed.

10. The effect of radiation on the nervous system:

Exposure to more than 5,000 rem destroys the nerve signals that control such sensitive organs as the brain and the heart and thus leads to death.

11. The effect of radiation on the reproductive system:

Radiation affects the cells that produce semen in the male. Exposure to 250 rem will lead to sterility that will last for one year, while exposure to between 500 and 600 rem will cause sterility for between one and three years. Permanent sterility can be caused by exposure to between 300 and 600 rem.

12. Jordan does not possess any arms or ammunition of which depleted uranium is a component and is of the view that the use of such weapons pose grave risks to human beings, all living things and the environment.

Lithuania

[Original: English]
[17 May 2010]

1. There is no data so far with regard to the use of armaments and ammunitions containing depleted uranium in the territory of Lithuania.

2. Nevertheless, Lithuania takes into account the results of the numerous research works conducted worldwide providing data on the potential chemical and radiological toxicity of the depleted uranium and understands the threats, hazards

and consequences of the use of armaments and ammunition containing depleted uranium. Therefore, Lithuania supports the approach of suspending the use of armaments and ammunition containing depleted uranium until the results of the comprehensive study of hazards and health effects from depleted uranium become available.

3. However, the regulatory control and assessment of the benefit and detriment of the use of depleted uranium for military purposes due to restrictions applied and insufficient research data remain a complex task and require further civil and military consideration and analysis.

Mexico

[Original: Spanish]
[3 June 2010]

1. The views of the Government of Mexico on this issue are given below pursuant to General Assembly resolution 63/54, entitled "Effects of the use of armaments and ammunitions containing depleted uranium", adopted on 2 December 2008.

2. The studies on soil, water and food conducted by the World Health Organization (WHO), the United Nations Environment Programme (UNEP) and the International Atomic Energy Agency (IAEA) (see document A/63/170) have demonstrated that the use of this type of ammunition has minimal effects on the level of contamination of those elements in affected areas. No significant deformities or diseases have arisen from exposure of the general public to depleted uranium in the areas where such ammunition has been used. The use of depleted uranium therefore does not pose a radiological hazard to the population of affected areas.

3. While it is true that the public health risk arising from the use of this type of ammunition is minimal, it is also true that civilian populations in post-conflict situations consider remnants of depleted uranium on their land to be a threat.

4. Mexico believes that the use of radioactive material should be limited to peaceful purposes, such as activities relating to industry, health, research and the production of electricity, so as to avoid any use of nuclear material for weapons purposes.

5. For its part, Mexico is not researching the impact of the use of depleted uranium on human health or on the environment. Furthermore, Mexico is not using this material for the manufacture of armaments and ammunitions. However, it wishes to state the following:

(a) Uranium is a naturally occurring element used, among other things, in the generation of nuclear power. Depleted uranium is a by-product of the process of uranium enrichment in the nuclear power industry. Thus, depleted uranium is almost entirely U-238 and is about 60 per cent as radioactive as natural uranium;

(b) Chemically, physically and toxicologically, depleted uranium behaves in the same way as the metallic form of natural uranium;

(c) Peaceful uses of depleted uranium include counterweights in aeroplanes, and shields against radiation in medical radiotherapy units and transport of radioactive isotopes. Thus, depleted uranium is a dual-use product, used both in the nuclear industry and in other industries;

(d) Depleted uranium is used for heavy tank armour, anti-tank munitions, missiles and projectiles because of its high density and melting point, and easy availability. Depleted uranium weapons are regarded as conventional weapons and are used freely by armed forces;

(e) The health effects of depleted uranium depend on the route and magnitude of exposure (ingestion, inhalation, contact or in wounds), the characteristics of the depleted uranium (particle size and solubility) and the setting where it is used (military, civil, occupational);

(f) Mexico encourages WHO to continue studying the effects of low-level exposure from the use of armaments and ammunitions containing depleted uranium.

Netherlands

[Original: English]
[23 June 2010]

1. The Netherlands voted in favour of General Assembly resolution 63/54, in which the Assembly requested the Secretary-General to seek views of Member States and relevant international organizations on the effects of the use of armaments and ammunitions containing depleted uranium.

2. The Netherlands recognizes the need for additional research of the effects of the use of armaments and ammunitions containing depleted uranium and appreciates that this issue is being discussed in the forum of the United Nations. However, the reference in the resolution to the "potential" harmful effects of the use of depleted uranium munitions on human health and the environment cannot so far be substantiated by scientific studies conducted by relevant international organizations such as WHO.

3. The Dutch armed forces do not use munitions containing depleted uranium. In the context of multinational missions, however, it is not impossible that Dutch service personnel may operate in areas in which munitions containing depleted uranium are being or have been used by allies. The health and well-being of Dutch soldiers deployed on international missions is under the continuous scrutiny of the Dutch Government. Exposure to hazardous materials must be avoided to the greatest possible extent.

New Zealand

[Original: English]
[1 June 2010]

1. New Zealand does not possess stockpiles of depleted uranium armaments or munitions.

2. When New Zealand Defence Force (NZDF) personnel are deployed into operational areas where depleted uranium (DU) munitions may have been used, more stringent health monitoring has been undertaken on these personnel. To date no adverse health effects linked to DU have been identified in NZDF personnel.

3. New Zealand is following closely studies by international agencies on the potential health impacts of DU. The Government (through the NZDF and the Ministry of Foreign Affairs and Trade (MFAT)) will continue to monitor international developments, reports and studies on DU and potential health impacts.

Norway

[Original: English]
[7 June 2010]

1. Norway affirms its support for General Assembly resolution 63/54, entitled "Effects of the use of armaments and ammunitions containing depleted uranium". In accordance with paragraphs 2 and 5 of the resolution, Norway is pleased to offer its views on the effects of the use of armaments and ammunitions containing depleted uranium.

2. Norway has never possessed any ammunition containing depleted uranium. Norway takes note of reports by the World Health Organization (WHO), the United Nations Environment Programme (UNEP) and the International Atomic Energy Agency (IAEA), which so far have concluded that, according to available information, the harmful effects of depleted uranium to human health will be limited except under very special circumstances. The reports underline, however, that the long-term effects from the use of depleted uranium ammunition, including also for the environment, must be monitored and examined further.

3. Norway therefore welcomes continued work by WHO, IAEA and UNEP in this area. Norway also welcomes the increased involvement of civil society regarding this issue and has allocated some US$ 100,000 to fund a research project by the International Coalition to Ban Uranium Weapons (ICBUW) examining possible long-term effects of depleted uranium ammunition.

4. Norway will continue to cooperate closely with international partners in establishing the extent to which depleted uranium ammunition has harmful effects on human health or environment.

Panama

[Original: Spanish]
[21 June 2010]

1. As a member of the United Nations, the Republic of Panama is concerned by the use of conventional weapons containing depleted uranium and the ensuing repercussions for human health.

2. Accordingly, it believes that laws of war exist which prohibit the use of deadly and inhumane weapons away from the battlefield, or the use of weapons of war whose effects continue once a conflict has ended.

3. In accordance with the international treaties ratified by Panama, States have a duty to protect civilian persons in time of war or to prohibit the use of weapons which may be deemed to be excessively injurious or to have indiscriminate effects.

4. A full clean-up operation must therefore be carried out on board radioactively contaminated vessels where depleted uranium has been used, in order to protect the health of children and adults and to prevent environmental contamination.

5. Panama urges United Nations Member States to comply with the treaties ratified, to implement human protection standards and to use uranium only for globally accepted civilian purposes.

III. Replies received from agencies and organs of the United Nations system

International Atomic Energy Agency (IAEA)

[Original: English]
[15 June 2010]

1. Depleted uranium (DU) is one of the by-products of uranium enrichment and, like any other uranium compound, has both chemical and radiological toxicity. DU is only slightly radioactive, 60 per cent as radioactive as natural uranium. DU has the same chemical and physical properties as natural uranium. The chemical toxicity of uranium is normally the dominant factor for human health. However, in special circumstances in which DU was inhaled or ingested or where fragments came into close contact with individuals, it is necessary to also assess its radiological impact.

2. After the use of DU in conventional anti-tank munitions during conflicts in the Balkans and the Middle East, questions arose regarding the possible consequences of the existence of DU residues for local populations and the environment. As part of the United Nations system's effort to response to the requests of affected States to assess the consequences of the use of DU ammunitions in conflict situations, IAEA, with its unique statutory functions, i.e., to establish standards of safety for protection against radiation exposure and to provide for the application of these standards, has been involved in coordinated evaluation exercises.

3. A number of evaluations of the environmental and health impact of DU munitions have been performed by national and international organizations. IAEA participated together with UNEP and WHO in several international appraisals like

those in Bosnia and Herzegovina, Serbia and Montenegro, Kosovo, Kuwait, Iraq and Lebanon. The radiological framework for these studies was the *International Basic Safety Standards for Protection against Ionizing Radiation and for the Safety of Radiation Sources*[1] and the methodology was generally based on sampling campaigns, analyses of the environmental samples in recognized international laboratories and radiological assessments performed by international experts.

4. The objectives of these assessments have been to draw conclusions regarding the toxic and radiological safety and to make recommendations to mitigate the hazards to the population and the environment, on the basis of comprehensive surveys at specific locations where depleted uranium ammunition residues may have been spread. These studies exclusively dealt with civilian inhabitants and environmental radiological risk in areas affected by military actions after the conflicts were terminated. The results and conclusions are valid at the time of the assessments and, when possible and under certain grounds, prospectively. IAEA did not evaluate the impact of DU ammunition to the troops or the populations at the time of the conflicts.

5. In general, the results of these assessments indicated that the existence of DU residues dispersed in the environment does not pose a radiological hazard to the population of the affected regions. Estimated annual radiation doses that could arise from exposure to DU residues would be very low and of little radiological concern. Annual radiation doses in the areas where residues do exist would be of the order of a few microsieverts, well below the annual doses received by the population from the natural sources of radiation in the environment and far below the reference level recommended by IAEA as a radiological criterion to help establish whether remedial actions are necessary.

6. Complete DU ammunition or fragments can still be found at some locations where DU weapons were used during past wars. Prolonged skin contact with these DU residues is the only possible exposure pathway that could result in exposures of radiological significance. As long as access to the areas where these fragments exist remains restricted, the likelihood that members of the public could come into contact with these residues is low. The recommendations to the national authorities, in all the cases studied where to collect any DU ammunition or fragments and any war equipment which have been in direct contact with these ammunitions and isolate them from the public in appropriate locations until it can be processed as low level radioactive waste and eventually safety disposed of. Some environmental remedial actions like covering of areas with uncontaminated soils could be convenient at some particular locations, depending on the use of the land.

7. In 2010 IAEA published the report *Radiological Conditions at Selected Areas of Southern Iraq with Residues of Depleted Uranium*,[2] which provides the results of a radiological assessment conducted in Southern Iraq by IAEA in cooperation with

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[1] Food and Agriculture Organization of the United Nations, International Atomic Energy Agency, International Labour Organization, OECD Nuclear Energy Agency, Pan American Health Organization, World Health Organization, *International Basic Safety Standards for Protection against Ionizing Radiation and for the Safety of Radiation Sources*, Safety Series No. 115, IAEA, Vienna (1996).

[2] International Atomic Energy Agency, *Radiological Conditions at Selected Areas of Southern Iraq with Residues of Depleted Uranium*, Radiological Assessment Reports Series, IAEA, Vienna, May 2010.

UNEP and the Radiation Protection Centre (RPC) of the Iraqi Ministry of the Environment. The results in this report are conclusive that the radiation doses from DU dispersed in the environment do not pose a radiological hazard to the populations at the four locations studied. The report also provides recommendations for the safe management of the fragments of DU which can be found in the region and, moreover, on the activities related to metal recycling of the abandoned military vehicles and armoured war tanks that could contain DU residues.

8. After the conclusion of the investigations in which IAEA participated, the national authorities in the affected regions should have had the competence and equipment to carry out the necessary monitoring, survey and remedial activities in relation to DU. This was actually observed in all the cases studied.

9. IAEA, together with UNEP and WHO, provided a coordinated response to the request of its member States to assess the post-conflict radiological risk to the public and the environment from the contamination of territories with DU residues. IAEA generally concluded that the radiological risk was not significant and could be controlled with simple countermeasures conducted by national authorities. It was also observed that in a post-conflict environment where the social and economic disruption is high, the radiation fear linked to the presence of DU residues further increases the anxiety of the population. In many of the concerned countries the results of the radiological evaluations provided a basis for public reassurance due to the low significance of the radiological impact.

World Health Organization (WHO)

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1. WHO has been cooperating on the topic of depleted uranium (DU) with the United Nations Environment Programme (UNEP) and the International Atomic Energy Agency (IAEA) in the assessment of potential impact of DU in post-conflict areas; for example, in Bosnia and Kuwait. Earlier reports of the international organizations focused on environmental and health impact of depleted uranium. Depleted uranium concentration levels in soil exceeding background levels of uranium was reported close to locations of depleted uranium shrapnel or remains of tanks left after military operations. Over time, the depleted uranium concentration is dispersed into the wider natural environment by wind and rain. People living or working in affected areas may inhale re-suspended contaminated dusts.

2. In 2005-2006, following the request of Iraqi national authorities, WHO participated in UNEP-led capacity-building effort for Iraqi specialists that included training and workshops held in Amman and Geneva on assessment and management of environmental DU exposure (see UNEP, Technical Report on Capacity-building for the Assessment of Depleted Uranium in Iraq (Geneva, 2007)).

3. Over the last decade, the World Health Organization (WHO) has developed comprehensive information material regarding the assessment of potential health effects of environmental DU in post-conflict areas. Guidance on sources and effects of DU was developed for medical doctors and programme administrators, in collaboration with the United Nations Joint Medical Staff (see http://www.who.int/ionizing_radiation/en/Recommend_Med_Officers_final.pdf) in 2001. WHO also produced a

report in 2001 entitled *Depleted uranium: sources, exposure and health effects* (see http://whqlibdoc.int/hq/2001/WHO_SDE_PHE_01.1.pdf).

4. As an update to the 2001 report, a review of the most recent scientific evidence on health risks from various DU exposure situations was conducted over the last two years (2008-2009). This material is currently under review before publication. Recent epidemiological studies have not offered new evidence regarding health effects of human exposures to DU.